A guide to the management of urologic dilemmas for the primary care physician (PCP)

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Patients with urologic conditions may present to a primary care physician (PCP) in the emergency department or in the PCP's office. Some conditions are true emergencies that require immediate surgical intervention. Others may require medical treatment or possibly simply reassuring the patient that there is no serious medical problem. Sometimes the diagnosis can be easily made, whereas other times the PCP needs to be able to rule out serious causes for a presenting problem and execute a guideline-recommended patient work up, to make a final diagnosis. Sometimes recommended diagnostic tests may not be readily available. When a PCP believes that a patient may have a serious urologic condition and is unsure of the

appropriate patient management strategy, then he or she must quickly refer the patient to a urologist. This article describes common urology-related issues—hematuria, prostate-specific antigen (PSA) test interpretation, phimosis and paraphimosis, acute scrotal pain and masses in the child and adult, urinary tract infection, renal colic, and castration-treatment-induced bone loss. It provides insights into decision-making processes for patient management of some urologic conditions, and information about managing sequelae and side effects of long term treatment. It includes practical diagnostic suggestions and patient management strategies based on the authors' years of urologic clinical practice experience.

Key Words: urologic dilemmas, management, primary care physician

Introduction

Patients may present to a primary care physician (PCP) in the emergency department or in the PCP's office with a variety of urology-related conditions. Sometimes the diagnosis can be easily made, whereas other times the PCP needs to be able to rule out serious causes and execute a patient work up to make a final diagnosis. When a PCP believes that a patient may have a serious urologic condition and is unsure of the appropriate patient management strategy, then he or she must quickly refer the patient to a urologist. This article provides insights into common urology-related issues--hematuria, prostate-specific antigen (PSA) test interpretation, phimosis and paraphimosis, acute scrotal pain and masses in the child and adult, urinary tract infection (UTI), renal colic, and castration-treatment-induced bone loss.

Urologic dilemmas

Hematuria

Hematuria is the presence of red blood cells (RBCs) in the urine. In addition to being red from blood cells, urine may be red after a patient eats beets or ingests red dye from pills or food. A patient work up for hematuria, as with other medical-condition work ups, is usually accomplished by obtaining a full patient history, a complete physical examination, and laboratory investigations.

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Microscopic hematuria

It is quite common for a physician to detect RBCs in a microscopic urinanalysis or for the the all-pervasive urine dipstick to be positive for RBCs. It is imporant to determine if the hematuria is significant. Studies have defined significant hematuria as at least 8 RBCs/high power field (HPF) in a microscopic urinalysis or a least a moderate (2+) reading for blood on a urine dipstick. If the patient is older than 40 years old and smokes, then 5 RBCs/HPF might be considered significant.[1] See Figure 1.

Macroscopic hematuria

After finding macroscopic (also called "visible" or "gross") hematuria, the physician needs to determine if the patient has any pain, if the hematuria is in the initial, entire, or final part of the urine stream, and whether the patient has any blood clots.
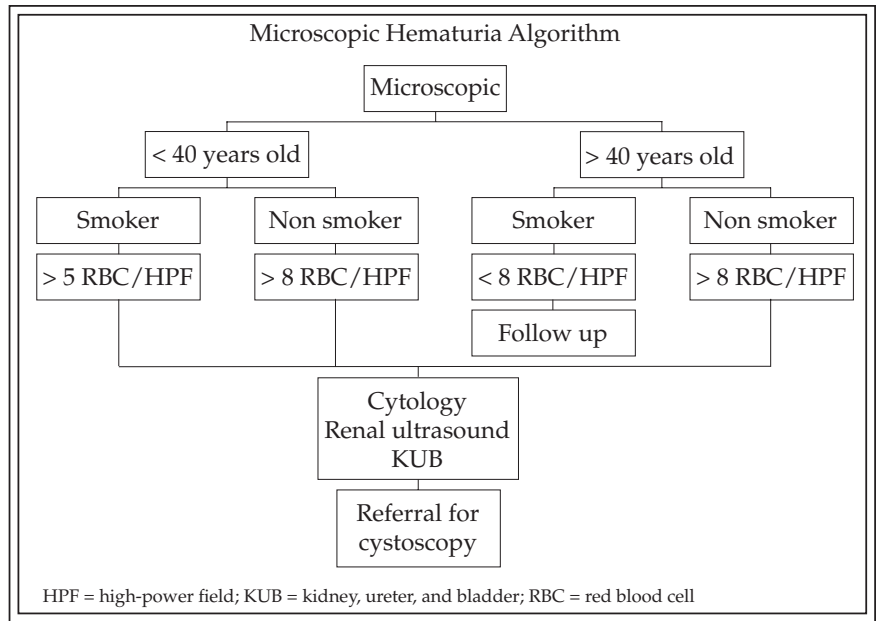

Figure 1. Algorithm for the evaluation of microscopic hematuria.

Figure 2. Algorithm for the evaluation of gross hematuria.

Gross hematuria with pain on one side usually indicates colic, which suggests that the patient is passing of a ureteric stone or there is bleeding from a lesion on that side.

If gross hematuria occurs throughout the urine stream and the pain is specifically in the pelvis, this suggests hemoragic cystitis, acute bacterial prostatitis, a bladder tumor, or a bladder stone.

Based on the anatomy of the urinary tract and the authors' clinical experience, hematuria throughout the urine stream indicates bleeding from above the bladder neck. Hematuria only in the initial part of the urine stream suggests bleeding from the urethra, whereas hematuria only at the end of the urine stream suggests bleeding from the prostate or bladder neck.

Patient work up

Finding significant microscopic or macroscopic hematuria requires a work up. See Figures 1 and 2.

If the patient only has pelvic pain and gross hematuria, antibiotics are usually given as first-line therapy. The clinician
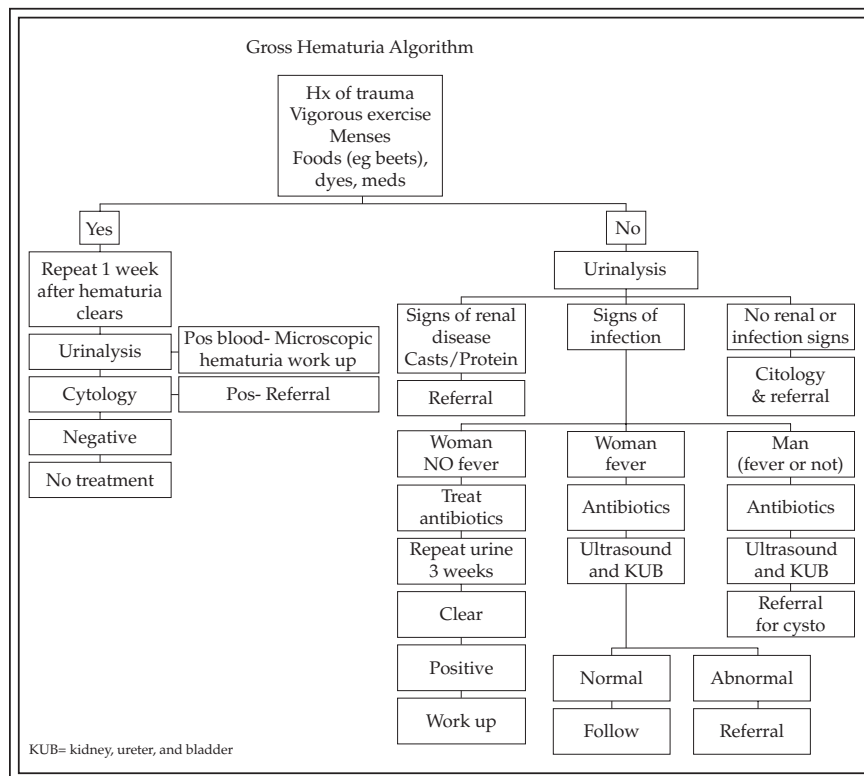
must be careful, however, if the patient has a negative urine culture. Even if the patient's bleeding stops afer a course of antibiotics, a negative urine culture should raise the suspicion that the patient may have a bladder tumor.

Rare causes of hematuria include a ruptured renal cyst, arteriovenous (AV)-ureteric fistula, or endometriosis of the bladder.

A minimum work up for patients with significant microscopic or macroscopic hematuria includes:

- Urinalysis to look for protein and casts, to rule out a renal cause
- A urine culture and sensitivity test
- Possibly a urine cytology test
- A flat plate x-ray of the abdomen showing the kidneys, ureter, and bladder (KUB), and an abdomial ultrasound
- Complete blood count (CBC), electrolytes, and creatinine blood tests to determine if the patient needs a blood transfusion or if their kidneys are affected
- Prothrombin time (PT), international normalized ratio (INR), and platelet count should be performed if the patient is taking a blood thinner or if blood dyscrasia suspected

If a patient has gross hematuria with a negative culture, or other tests are inconclusive, then an abdominal computed tomography (CT) urogram is appropriate.

Referral to a urologist

Patients with gross or significant microscopic hematuria and a negative urine culture should be referred to a urologist. The urologist will perform a cystoscopy and possibly a retrograde pyelogram, as well as any other tests needed to determine the cause of the hematuria.

Prostate-specific antigen (PSA)

PSA is a serine protease enzyme that is only produced within the prostate, which means that it is specific to the prostate. Serine protease, a glycoprotein, is involved in the liquefaction of seminal coagulum and the release of motile sperm.

Total PSA

The total PSA test has a 75% sensitivity, but only a 40% specificity for detecting prostate cancer. PSA is produced by both benign and malignant cells. It takes a lot of benign prostatic hyperplasia (BPH) to raise PSA levels, or a little prostate cancer to raise PSA levels.

Conditions that interfere with the integrity of prostate cell membranes allow PSA to leak into the blood. Serum PSA may be elevated in patients who have prostatitis, a UTI, or prostate cancer, or those who had recent sexual activity or a recent, vigorous digital rectal examination (DRE) or recent urethral instrumentation.

Therefore, do not request a PSA test in the emergency department if the patient is presenting with signs and symptoms of acute bacterial prostatitis or an acute UTI, because it will be artificially elevated. One should always do a DRE before drawing a blood sample for a PSA test, or if after a vigorous DRE wait 30 minutes before drawing blood for a PSA test. However, a typical DRE should not raise the PSA level significantly.

Controversy about PSA screening tests to detect prostate cancer

When to do PSA testing to screen for prostate cancer has been controversial for some time. The controversy came to a head a few years ago when a US Preventive Services Task Force (USPSTF) recommendation discouraged this screening.[2] However, Canadian,[3] American,[4] and European Urological Associations[5] all recommend regular screening for men over age fifty.

The US Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial[6] on which the USPSTF based its PSA testing recommendations was seriously flawed. First, the task force did not include a urologist. More importantly, there was a 52% contamination rate in the PLCO trial—that is, more than 50% of the patients had already had a previous PSA, and patients with high PSAs who required biopsies should have been excluded from the trial, because they were already pre-screened. The trial was designed to assess and follow only patients who had never had a PSA before, which represents "true" screening.

Table 1 summarizes the European Randomized Study of Screening for Prostate Cancer (ERSPC), the Göteborg prostate-cancer screening trial (where there was a small contamination rate), and the PLCO study.

Age-related PSA

Different approaches have been used to make PSA testing more specific for prostate cancer. A PSA of 4 ng/mL was widely accepted as indicating a suspicion of prostate cancer, and many studies have shown that this threshold PSA level is accurate for suggesting possible prostate cancer in men who are 60 and older. However, serum PSA levels can be elevated in conditions other than prostate cancer that disturb the normal architecture of the prostate, including inflammation of the prostate (prostatitis), inflammation

TABLE 1. **Prostate cancer screening studies**

	PLCO		ERSPC		Göteborg	
Period	1993-2001		1994-2006		1995-2008	
Number	76,693		162,243		20,000	
Age	55-74 (13% > 70)		55-69		50-64	
Site	Multiple centers (US)		7 countries (Europe)		1 city (Göteborg, Sweden)	
Methods	PSA > 4 ng/mL Abnormal DRE		PSA > 3 ng/mL Abnormal DRE		PSA > 2.5 ng/mL (from 2005 on) PSA > 2.9 ng.mL (from 1999-2004) PSA > 3.4 ng/mL (from 1995-1998)	
Follow up	Every 1 year X 6 11 years median follow up		Every 4 years 9 years (complete)		Every 2 years 78% had 14 year follow up	
Contamination	**52%**		Not known		3%	
	Control	**Screened**	**Control**	**Screened**	**Control**	**Screened**
Prostate cancers	6%	7.3%	4.8%	8.2%	7.2%	11.4%
Prostate cancer deaths	44	50	326	214	78	44
Risk ratio	NS		20% (p = 0.04)		44% (p = 0.002)	
NNS	-		1:1410		1:293	
NNT	-		1:48		1:12	

Adapted from Gomella et al. *Can J Urol* 2011[7]
PLCO = US Prostate, Lung, Colorectal, and Ovarian cancer screening trial[6]
ERSPC = European Randomized study of Screening for Prostate Cancer[8]
Göteborg = Göteborg randomised population based prostate cancer screening trial[9]
NNS = number needed to screen
NNT = number needed to treat

of the bladder, UTIs, significant BPH, significant bike riding, or even sex in the 12 hours preceding a PSA blood test.

The greatest risk factor for an enlarged, benign prostate is age. It is important to realize that there are age-specific levels of PSA. Using an age-specific PSA threshold makes the PSA test to detect prostate cancer more specific and sensitive. See Table 2.[10]

Free/total PSA
If the free/total PSA ratio is greater than 0.2 (20%), there is a less than a 10% chance of prostate cancer,

and if it is < 0.10 (10 %), then there is a greater than 90% chance of prostate cancer. This test was originally developed to help clarify the meaning total PSA values between 4 ng/mL and 10 ng/mL, which fell in the gray zone for prostate cancer.

Determining the free/total PSA ratio when total PSA less than 1 ng/mL is of little value.[11]

PSA velocity
Determining the PSA velocity (rate of rise in PSA over time) may improve the sensitivity of PSA tests. When baseline PSA is between 4 ng/mL and 10 ng/mL, a rise in PSA that is greater than 0.75 ng/mL/year may indicate a higher risk of prostate cancer. Similarly, for baseline PSA levels below 4 ng/mL, a rise in PSA of 0.4 ng/mL/year denotes a higher risk of prostate cancer.

It was previously believed that an absolute 0.75 ng/mL/year rise in PSA indicated a suspicion of prostate cancer. However, it is now generally accepted that PSA velocity is age related. See Table 3. A small rise in PSA, which reflects increased growth of benign prostate tissue, can be normal in younger men.[3]

TABLE 2. **Age-related normal PSA levels[10]**

Age (years)	PSA threshold (ng/mL)
40-49	≤ 2.5
50-59	≤ 3.5
60-69	≤ 4.5
70 +	≤ 6.5

PSA = prostate-specific antigen

TABLE 3. **Age-specific normal PSA velocity cut points**

Age (years)	PSA velocity cut point (ng/mL/year)
40-59	0.25
60-69	0.50
> 70	0.75

PSA = prostate-specific antigen

Predicted PSA based on prostate volume

Larger-volume, benign prostates can also express higher levels of PSA. Sometimes it is difficult to determine the accurate volume of the prostate just by doing a DRE.

A transrectal ultrasound (TRUS) is very useful to provide an accurate determination of the volume of a prostate. The "predicted PSA" of a benign prostate is "volume times 0.12." This can provide an indication of whether a serum PSA level is elevated due to a large, benign prostate or due to cancer.[12]

PSA density

PSA density is total PSA divided by prostate volume. A PSA density of greater than 0.15 is suggestive of prostate cancer.

TRUS

Be careful of using a TRUS to detect prostate cancer. There have been too many false positives and too many false negatives over the years. Therefore, guidelines do not recommend doing a TRUS to rule out prostate cancer, although this test is very helpful for determining the volume of the prostate.

As discussed in the article on BPH by Rosenberg in this supplement,[13] a PSA > 1.5 ng/mL, regardless of the age of the patient, represents a prostate volume of at least 30 ccs. Guidelines recommend that patients with a prostate of > 30 ccs or a PSA > 1.5 ng/mL should be treated with combination therapy with an alpha-blocker and a 5-alpha reductase inhibitor (5-ARI) to prevent the progression of BPH to urinary retention or the need for surgery.

PSA response to 5-ARIs

As mentioned earlier, to treat an enlarged prostate (> 30 ccs), guidelines recommend combination therapy with an alpha-blocker and a 5-ARI. Alpha-blockers have no impact on PSA. However, 5-ARIs ARE EXPECTED to lower PSA. If we do not see an almost 50% drop in PSA after 6 months of treatment with finasteride or a continual drop to a PSA nadir (lowest level) after 6 months of treatment with dutasteride, then the patient may have underlying cancer and should be referred to a urologist. Before referring the patient, repeat the PSA test 2 to 4 weeks later, to confirm an increase or a lack of decrease from the previous value.

PCA3

Prostate cancer antigen type 3 is a newer test that may be useful in a patient who has had a negative biopsy. PCA3 is measured in urine. The first 200 ccs of urine expressed after a vigorous rectal massage are analyzed to determine the ratio of cells that express the PCA3 antigen to cells that do not. By definition, if the ratio is > 35, then there is a high chance of detecting prostate cancer on a biopsy.[14]

Phimosis

By definition, phimosis is a foreskin that is either so tight or so stuck that it cannot be fully retracted, such that the full head of the penis right back to the coronal sulcus is exposed. In young boys and more elderly men, phimosis can result in resistance to urinary outflow causing burning, recurrent UTIs, or dribbling after voiding, as the retained drops of urine seep out from under the foreskin.

Some men will complain that there is cracking or tearing of the foreskin or the frenulum (the tissue band on the ventral aspect of the penis) with erections. The persistence of urine on the glans under the foreskin can also result in balanitis or inflammation on the head of the penis. Often mothers will report that their son has "white bumps" under the foreskin. These bumps represent "retained smegma" that is loculated behind the subcoronal adhesions. Finally, sometimes the foreskin is so tight that a man cannot urinate at all, and it is almost impossible to pass a catheter.

Treatment

To treat phimosis, in an infant or young boy, a parent can be instructed to apply a daily steroid cream to the boy's foreskin and gently retract the boy's foreskin in the bath every night, and sometimes the adhesions will open and the loculations can be expressed.

If it is just the frenulum that is tight and tearing, then under local anesthetic, one can transect the frenulum and it should heal easily. If there are remaining issues and conservative measures do not work, and in an emergency setting if the problem is passing a catheter, then a dorsal slit may be performed under local anesthetic.

A circumcision is usually the best alternative if there are significant complaints. Occasionally, if the patient is strongly attached to his foreskin, then a partial, more distal circumcision can be performed, where one

excises the "distal fibrotic ring," leaving the remaining softer foreskin that can then be retracted. This allows partial coverage of the glans, which a lot of men prefer.

The controversy over full circumcision has existed for a long time. Every 10 years or so, pediatric associations change their recommendations for routine infant circumcisions. A number of organizations have spoken out quite vigorously about infant circumcision, as described in other articles.[15]

Paraphimosis

Paraphimosis is when a foreskin has been retracted behind the head of the penis, and because of the tightness of the foreskin and usually some swelling of the glans, the patient is not able to bring the foreskin back over the head of the penis. As a result, there is decreased venous drainage that causes more swelling of the glans that makes the "collar" even tighter. This may actually cause strangulation of the head of the penis and necrosis.

If severe, this is an emergency.

Management
1) Ice to the glans will decrease the swelling as well as numbing it.
2) If still very severe and painful, then a penile block using local anesthetic can be performed.
3) Physically squeeze the glans to encourage some venous drainage and reduce the swelling.
4) Use gloves and two pieces of gauze to allow you to grasp the foreskin on either side, and as you pull the foreskin forward, push the glans back inside with your two thumbs.
5) If you are successful, the patient will have immediate pain relief. If not, one may have to perform an emergency dorsal slit to relieve the pressure.
6) Often after a patient has recovered from a bout of paraphimosis, he will request a circumcision.

Acute scrotal pain

When a man presents with acute scrotal pain, he may have a condition that is an emergency and requires surgery or medical treatment OR he may have a condition that requires no medical intervention.

Paratesticular problems include hernia/hydrocele, painful testicle, testicular torsion, and epididymitis/orchitis.

Hernia
A hernia is the result of the bowel or mesentery that either protrudes through the floor of the inguinal canal or along the potential connection between the peritoneal cavity and the scrotum (the path that the testicle follows in development), attached to the gubernaculum.

The patient presents with a bulge that is usually not tender and does not transilluminate in a darkened room. If the neck of the hernia starts to get tight around the loop of the bowel, it may become incarcerated, meaning that it cannot be reduced or pushed back when the patient is lying on his back, usually without his head being elevated on a pillow. If the lump can be reduced, this usually indicates the patient has a hernia. The lump should be above the testicle. If the neck of the hernia is so tight that it reduces venous return, then infarction of the bowel may occur, causing a serious condition and sepsis. An incarcerated, painful hernia is a surgical emergency.

If fluid is tracking down from the peritoneal cavity through the patent processus vaginalis, then one will present with a non-tender, transilluminable scrotal mass called a "communicating hydrocele."

Hydrocele, spermatocele
If the neck of the processus vaginalis closes off or if the fluid collection is loculated within the tunica vaginalis (that potential envelope outside of the coating of the testicle), then the patient has a simple hydrocele. Hydroceles that occur as a result of trauma, inflammation, or infection do not require urgent treatment. A hydrocele that develops as a reaction to a testicular tumor must be treated urgently by removing the tumor.

A spermatocele is a cystic structure found at the upper pole of the testicle. It usually arises from the head of the epididymis. Usually one can feel the testicle separate from the spermatocele. It is also non tender, may be transilluminated in a darkened room, and is not an acute emergency. It occurs as a result of blockage of some of the channels in the epididymis, usually as a result of minor trauma, which results in back-up of sperm causing the development of a cystic structure. It is totally benign and will not become cancerous.

Painful testicle
A patient—usually a younger boy—may present with acute pain and tenderness in the upper pole of the testicle, separate from the epididymis. By shining a light on this area, after determining that the whole testicle is not tender and swollen, one can often see the "blue dot" sign—a small blue lesion that represents the "torsion of the appendix testicle." This is not an emergency. The pain is short-lived and there is no significant swelling.

If in doubt, or concerned about testicular torsion (described further in this article), a Doppler ultrasound

will show that there is good blood flow to the testicle, with a small defect in flow at the upper pole of the testicle.

Testicular torsion

A patient—usually a young man—will typically present in the middle of the night with an exquisitely tender total testicle. There can be significant scrotal swelling (edema) and often swelling in the scrotal skin as well. This will often suggest a testicular torsion, which is an acute emergency. The testicle will usually twist on the spermatic chord. Initially, venous return will be lost, causing pain and more swelling. Once the venous blockage reaches a certain level, it will cause secondary decreased arterial inflow leading to an infarcted or dead testicle.

One usually has about 6 hours from the time of pain onset until the emergency repair to salvage the testicle. Because of the twisting on the chord, the testicle will normally be higher in the scrotum and not hanging in the normal vertical axis.

Epididymitis/orchitis

In this case, a man, usually older than 30, will present with a very tender epididymis or tender testicle or both. The scrotal skin will not be edematous and the testicle will be lower in the scrotum and hanging in the normal position. The patient will usually have a fever and signs of a UTI. The theory is that there is a sudden increase in abdominal pressure at the same time that a few drops of urine leak into the prostatic fossa. It can be secondary to heavy lifting, a bowel movement, or even sexual activity. The result is that some urine will reflux either through the vas deferens or some of the pelvic veins, usually first into the epididymis and later into the testicle causing inflammation or a significant infection.

The following maneuver may sometimes help distinguish between testicular torsion and acute epididymal-orchitis. With the patient lying down, if one elevates the scrotum, there will be an impact on the perceived pain. If the patient has an infection, the elevated scrotum encourages the testicle to drain, which reduces some of the swelling and results in reduced pain. If the pain is secondary to torsion, then elevation of the scrotum does not allow fluid to drain away, because the drainage is blocked, and the pain may be exacerbated.

Some men report that they had some swelling in their testicles and then later developed severe pain. This could represent bleeding into a testicular tumor. Men should do a testicular self-examination every month. If they detect a hard, non-tender lump, they should seek prompt medical attention.

The best way to assess a patient with acute scrotal pain is with an emergency color ultrasound Doppler (USD). This will tell you if there is decreased or increased blood flow to the testicle (torsion versus infection/inflammation) or if there is fluid around the testicle or a hernia. It will also suggest if there is a mass within the testicle.

Urinary tract infections

In a female patient, a sudden onset of urinary frequency, urgency, and dysuria with or without hematuria, and without fever usually signifies a bout of simple cystitis. Sometimes this is related to sexual intercourse or prolonged retention of urine.

For women who present with a UTI for the first time, a 3 day course of antibiotics is usually sufficient. If urine-culture-proven UTIs recur more than two times a year, then a 10 day course of antibiotics and a work up with renal and pelvic ultrasound (KUB) is appropriate. If any abnormality is found (such as an elevated post void residual urine volume, hydronephrosis, or a renal or ureteric stone) or if a woman has more than two UTIs in a year, then she should be referred to a urologist.

Simple lifestyle changes such as wearing cotton underpants, wiping in the right direction, not holding the urine, double voiding, and voiding after intercourse may help prevent the recurrence of simple cystitis.

If a woman has confirmed fever or an elevated white blood cell count with the UTI, then she should be referred to a urologist after antibiotic treatment. Any man with a documented, urine-culture-proven UTI should be referred to a urologist after the first attack. For a complete review of UTIs see Mazzulli et al.[16]

Renal colic

Renal stones have been described as far back as the time of the Pharaohs, where they were depicted in Egyptian hieroglyphics.

It was previously believed that bladder stones were more common than renal stones. But as we have become more aware of the sequelae of untreated BPH and urinary retention, the incidence of bladder stones has decreased, in parallel with an increasing incidence of kidney and ureteral stones.

Renal colic is said to be the most uncomfortable pain that a man can have. Women who have experienced childbirth often say that the pain from renal colic is worse than the pain from childbirth.

Presentation

The patient usually presents with excruciating, waxing and waning, lateralizing pain. The location of the

stone as it leaves the kidney will often determine the level of the pain. The pain starts in the flank and back just under the ribs and radiates around the side and down onto the pelvis and testicle in a man or to the labia/vagina in a woman. It is usually accompanied by nausea and vomiting. Commonly, the patient has microscopic or gross hematuria.

If the patient has fever with the renal colic and the work up suggests there is significant hydronephrosis, intervention is necessary to drain this "closed space" or the patient could sustain gram-negative septicemia and shock.

If the stone is in the lower ureter, near the "ureterovesicle junction," the patient may have significant frequency and urgency with small urine volumes and no sign of infection. This is a detrusor reflex, since the stone irritates the lower ureter.

The diagnosis can often be made with an ultrasound of the kidneys, ureters, and bladder (KUB), a urinalysis, a plain KUB x-ray and, if available, a CT scan of the kidneys, ureters, and bladder (CT KUB or CT urogram).

Patients are given an analgesic for the pain of a ureteral stone, and are prescribed an antibiotic if they have any elevation in their temperature that could indicate at least partial obstruction of the ureter. Since the ureter consists of smooth muscle, guidelines also suggest prescribing an alpha-blocker for men and women who have ureteral colic due to a ureteral stone. Alpha-blockers that selectively relax the ureteral smooth muscle could reduce ureteral spasms, which would help relieve the pain. At the same time, the ureteral lumen could expand, allowing earlier expulsion of the stone.

A recent paper by Gupta et al[17] compared the commonly used alpha-blocker tamsulosin with the newer alpha 1A selective alpha-blocker silodosin for the management of ureteric stones. The study showed that the stone expulsion rate was 58% for the tamsulosin group and 82% for the silodosin group, and the time to expulsion was 19.5 days with tamsulosin versus 12.5 days with silodosin.

With this new therapeutic approach, almost 2% of patients with renal colic who present to an emergency department and are prescribed alpha-blockers may be spared from further interventions such as endoscopic manipulation.

Castration-treatment-induced bone loss

Prostate cancer is the number one diagnosed cancer and the third leading cause of cancer-related death, in men in North America. For a further discussion on prostate cancer, see Gomella et al.[18]

Some patients with prostate cancer may not desire or tolerate certain prostate cancer curative treatments, or if the primary curative treatment fails, these men may be offered surgical or medical castration. By reducing the production and/or the uptake of testosterone into the prostate or the cancer areas, the cancer can shrink or lie dormant or be controlled for many years. This approach is analogous to "removing the fuel from the fire." Prostate cancer will grow under the stimulus of testosterone, so by excluding testosterone, in many cases we can slow or prevent the progression of prostate cancer. The medications include luteinizing hormone-releasing hormone (LHRH) analogues or antagonists and the anti-androgens.

Testosterone is necessary for many physiologic functions in men. By preventing its production, men who receive medical castration are at increased risk for conditions such as osteoporosis, metabolic syndrome, diabetes, obesity, muscle loss, and hot flashes.[19]

Medications to treat osteoporosis include bisphosphonates such as zoledronic acid and the human monoclonal antibody denosumab. The latter drug prevents RANK-ligand (RANKL)- RANK interaction and thereby inhibits the development of bone demineralization. To help protect bones from the effects of low or absent testosterone, patients are also prescribed vitamin D and calcium and advised to exercise and stop smoking.

Careful management of existing or newly diagnosed diabetes in the setting of hormonal ablation is very important, since the expected biochemical response to diabetic medications might be altered.

Awareness of the potential side effects of medications that may not only increase survival and delay progression of prostate cancer allows clinicians to provide support to patients to help them maintain a better quality-of-life.

Conclusion

The PCP is often the first-line assessor of many urgent and non-urgent, malignant or benign urologic conditions. With this article, based on the literature and years of front-line experience, the authors hope that PCPs will better understand how to diagnose and manage some common urologic presentations and know when to refer a patient to a urologist.

Disclosures

Dr. Jack Barkin has been a clinical investigator, speaker and medical advisory board member and consultant for Abbott, Lilly, Bayer, Paladin, Actavis, AstraZeneca,

Astellas, Pfizer and Triton. Dr. Matt T. Rosenberg has been a speaker and consultant for Astellas, Easai, Ferring, Forest, Horizon, Ortho-McNeil, Lilly, Pfizer and Bayer. Dr. Martin Miner has been a consultant for Abbvie and Endo. He has also done research for Forest. ☐

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